



UNEP **Finance Initiative**  
Innovative financing for sustainability

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# CEO briefing

A document of the UNEP FI Biodiversity and Ecosystem Service Work Stream (BESWS)

**“ As the global financial sector recovers and moves into the post financial crisis era, there is one notion that crystallises before our eyes more acutely than ever: we need to understand systemic risk in a much more holistic way. This CEO Briefing underscores the critical natural capital that underpins our economic activity and financial capital. ”**

**Richard Burrett**

Partner in Earth Capital Partners  
Co-Chair, UNEP Finance Initiative

## Demystifying Materiality

Hardwiring biodiversity  
and ecosystem services  
into finance

# Demystifying Materiality

## Hardwiring biodiversity and ecosystem services into finance

**In 2010, a number of large food and beverage companies, including Unilever, Nestlé, Burger King and Kraft Foods, disengaged from the Indonesian Sinar Mas Group and its subsidiaries' owing to the company's alleged illegal logging. In the United States, a growing number of banks, such as Credit Suisse, Morgan Stanley, JPMorgan Chase, Bank of America and Citibank, have increased scrutiny of lending to companies involved in mountaintop-removal mining, or have ended the lending altogether.<sup>2</sup> BP's oil spill in the Gulf of Mexico is another recent case that shows a growing level of materiality of biodiversity and ecosystem services (BES) issues for companies and financial institutions that provide debt, equity and insurance services.**



“ As the world increases its awareness on the importance of nature for society, companies are seeking to operate in a sustainable way in order to protect the environment and the future of humanity. We fully support every initiative providing guidance to companies in the process of learning why biodiversity is important, and how businesses may contribute to its conservation. **Knowing and understanding are fundamental to start doing.** ”

**Eduardo Villar**

Chair of the Board, BCSC Bank

**T**he links between financial services, risk and BES have, to date, been weak. Resource scarcity, loss of biodiversity and degradation of ecosystem services such as freshwater availability have, however, started to present financially material risks and opportunities for bankers, investors and insurers. This is particularly the case with financial institutions that have a large exposure or client base in industries directly dependent on BES, such as fisheries, agriculture and tourism, and industries with major BES footprints, such as the extractive sectors.

Leading companies are taking steps to better understand and manage their impacts and dependence on BES. Senior executives in financial institutions should recognise that biodiversity is not something to be dealt with as a peripheral issue or merely as philanthropy. Hardwiring BES into the heart of business models and core strategies is vital for long-term growth and success. This can be achieved by embedding evaluation and management of BES risks and opportunities directly in financial products and services.

This Briefing is intended for forward-looking financial institutions to operationalise BES in the financial sector. It builds on earlier work by UNEP FI's Bloom and Bust report<sup>3</sup> and the TEEB reports, combined with our own analysis. This Briefing offers executives:

- 1 Insight** regarding the materiality of BES for a diversified financial sector, by highlighting results from a new UNEP FI survey;
- 2 Examples** of how financial institutions currently embed BES in lending, investment and insurance strategies and products, to enhance risk management, financial performance, stability and future growth;
- 3 Ways** in which a financial institution can competitively position itself to tap into growing environmental markets;
- 4 Recommendations** for how BES can be further hardwired into finance and a vision for how financial institutions may account for BES in 2020.

# 1 The evolution of environmental materiality in the financial sector

**T**he financial crisis of 2007–2008 saw world-wide financial assets fall by USD 16 trillion to USD 178 trillion in 2008 from their peak of USD 194 trillion in 2007<sup>4</sup>. Misaligned incentives, conflicts of interest, a predominance of short-termism, failures of both accountability and responsibility and, in some cases, a misplaced sense of fiduciary duty have occurred at many different points along the investment chain and throughout the processes of financial intermediation<sup>5</sup>. In a sense, financial risk ran ahead of the world's ability to understand and manage it.

The growth of securities, the deconstruction and (re)distribution of credit risk through securitisation, and the growth of computer power and modelling in risk management are thought to have resulted in a misplaced belief in enhanced understanding of risk<sup>6</sup>. Yet, ironically, it may have resulted in a reduced understanding of systemic risks in loan and investment products and volatility created by the enhanced ability to trade. There is a similarity between the underlying factors that contributed to the financial crisis and the environmental risks involved. Changing environmental phenomena such as threats to biodiversity and ecosystem services (BES) loss, climate change and water scarcity, and how these translate into tangible financial risk, are also little understood in terms of financial materiality.

Financial stability may already be affected by environmental phenomena that manifest themselves through 'slow failures and creeping risks' in the context of ecosystem loss and degradation. Drivers are emerging that enhance the complexity of these risks:

**Biodiversity** is defined as 'the variability among living organisms, which includes the diversity at ecosystem, species and genetic levels' – as stated in article 2 of the Convention on Biological Diversity. Ecosystem services are the goods and services that biodiversity provides. In the context of this CEO Briefing, and to make it operational for the financial sector, these terms are combined under the acronym 'BES'.



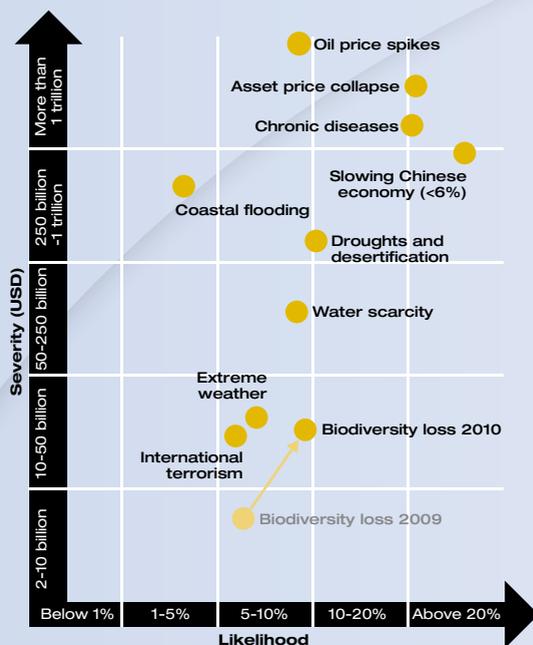
**“ Increasingly, finance professionals are realizing the importance of protecting our world's biodiversity resources.**

As a company specialized in sustainable and responsible investment management, Calvert includes language on biodiversity in our proxy voting guidelines. We encourage other investment companies to implement similar concrete steps into corporate operations and decision-making. ”

**Barbara J. Krumsiek**  
President & CEO, Calvert Group, Ltd  
Co-Chair, UNEP Finance Initiative

- **Increased regulatory and liability regimes by governments** seeking to protect their ecosystems – e.g., the EU Habitats Directive;
- **Increased disruptions of supply chains** that rely on well-functioning ecosystems such as forestry, fisheries and agriculture;
- **Increased attention by media, empowerment of local populations, activism by non-governmental organisations (NGOs), and heightened sensitivity of international consumers** to environmental, social and governance (ESG) concerns.

Figure 1  
Global Risks  
Landscape  
2010



■ According to a World Economic Forum (WEF) survey, both 'the severity of economic loss' and 'the likelihood that biodiversity has a business impact' jumped between 2009 and 2010 (Figure 1), although the level of materiality is still perceived to be lower than many other outside environmental and non-environmental influences<sup>8</sup>. A number of issues ranked as being of greater concern, such as coastal flooding or water scarcity, are fundamentally affected by degradation of biodiversity and ecosystem services.

■ PricewaterhouseCoopers (PwC) found that 27% of 1200 CEOs surveyed were 'extremely' or 'somewhat' concerned about biodiversity loss being a threat to business growth prospects, which varies across geographies. More executives in Latin America appear to be concerned (at 53%) than in North America (14%) or Eastern Europe (11%). See Figure 2<sup>9</sup>.

■ A McKinsey survey<sup>10</sup> of more than 1500 business executives revealed that 37% considered biodiversity 'somewhat important' and 27% 'very or extremely important'.

Figure 2  
Perception of  
CEOs about  
biodiversity  
loss as a threat  
to business  
growth  
prospects



Financial institutions that do not understand how these phenomena influence their investments, lending and insurance portfolios may not sufficiently factor in these new emerging risks<sup>7</sup>. Forward-looking banks, investors and insurers may find themselves positioned ahead of mainstream development by addressing BES in their products and services, building trust with corporate clients, governments and other stakeholders. In addition, early movers in emerging environmental markets may profit through their advanced understanding of changing business models.

Though BES is appearing on the radar screens of corporations, it is still down the list of priorities in terms of materiality, compared to other environmental, social and economic issues. The question is whether there is misalignment between corporate perception of exposure and understanding of risk and the level of BES materiality in practice. Do capital markets and the economy sufficiently account for risks associated with unpredictable changes in ecosystems? There may be a significant lag between a clear reflection of such risks and the hardwiring, notably pricing of risk, into the inner working of our financial system<sup>5</sup>. This is especially relevant for financial institutions that deal with highly BES-dependent and highly BES-impacted sectors. Equally, there is a need to better understand the opportunities in terms of tapping into emerging environmental markets, capacity building in risk management teams and the enhancement of corporate reputation.

## 2

# Understanding exposure of financial institutions to biodiversity loss

**L**oss of biodiversity and degradation of ecosystem services do not manifest themselves as systemic risks, as they do not threaten the very nature of the financial system. Increasingly, though, they are becoming financially material to bankers, investors and insurers in a myriad of other risks and opportunities. Methods to price the financial value of BES as part of a lost business opportunity or financial impact are in their infancy. However, a growing number of financial institutions, companies, governments and NGOs agree that what is needed are more sophisticated concepts and instruments to value (not simply price) how companies derive value from BES, or lose revenue. This section provides a synthesis in what ways a diversified financial sector becomes exposed to various BES risks.

### Reputational risks and emerging voluntary business principles

The Equator Principles (EPs) were initially developed in 2003 after a number of banks, including ABN Amro, Barclays, Citigroup and WestLB, received public scrutiny for their involvement in projects that damaged ecosystems<sup>11</sup>. As of June 2010, 80 banks representing 85% of the global project finance market signed up to the reinstatement of these ten principles, which means that a level playing field has started to emerge for this particular segment of the financial system. Project finance, however, only accounts for about 4% of overall global lending, arguing for a broadening of the principles beyond project finance and advisory services. Currently, the International Finance Corporation (IFC) and a few banks are assessing if and how the EPs can be extended beyond project finance<sup>12</sup>. These cases show how reputational risks related to BES and other ESG issues have transformed environmental and social due diligence in the project finance business, and potentially other financial products and services as well.



**“ The loss of natural capital (including ecosystems, biodiversity and natural resources) has direct and widespread negative effects on financial performance. Climate change**

and the financial crisis suggest that significant systemic risk requires coordinated policy intervention. The financial markets do not yet understand that many companies face specific risks from disruptions of vital ecosystems through their supply chains and that they need to plan for the impact of new regulation. This provides an investment and engagement opportunity for pension funds and other long term investors, who can encourage companies towards a better understanding and management of the risks and opportunities relating to the protection of natural ecosystems. ”

**Colin Melvin**

CEO, Hermes Equity Ownership Services Ltd

### Operational and credit risks for lenders, investors and insurers

BES has also become material for corporate and investment banking in terms of operational and credit risk. A study by the World Resources Institute (WRI) assessed financial implications of the possible restricted access of 16 oil and gas companies to reserves they own or lease in ecologically important and protected areas<sup>13</sup>. The WRI calculated that restricted access to their reserves due to global support for conservation, and/or local opposition to oil and gas development, could lead to negative impacts on the shareholder value of these companies of up to 5%. It is questionable whether conventional risk models that are commonly used in the marketplace account for and adjust share prices for these types of risks. The BP oil spill in the Gulf of Mexico provides a clear – albeit extreme – example of how misinterpreted BES risks can lead to serious financial consequences for both an extractive firm and investors.

### Are ESG issues leading to market and systemic risks for institutional investors that own large diversified investment portfolios?

There is one segment of the financial sector in particular where ESG-related market and possibly also systemic risks are emerging. Institutional investors such as pension funds are long-term

investors that own a significant share of capital markets. A portfolio investor benefiting from a company externalising costs might experience a reduction in overall returns due to these externalities adversely affecting other investments in the portfolio and overall market return, through taxes, insurance premiums, inflated input prices and the physical cost of disasters<sup>17</sup>. UNEP FI and the UN-backed Principles for Responsible Investment (PRI) – an initiative with over 800 signatories from the investment community that commit to six ESG-focused principles – commissioned Trucost to analyse and measure the magnitude of global environmental externalities<sup>18</sup>.

The study finds that human use of environmental goods and services caused an estimated global USD 6.6 trillion in environmental costs in 2008, taking future costs into account on a net present value basis<sup>19</sup>. This equates to 11% of the value of the global economy. If business continues as usual, this figure may rise to USD 28.5 trillion in 2050. A report titled 'Cost of Policy Inaction' (COPi)<sup>20</sup> uses a different valuation approach to estimate yearly welfare loss of ecosystem services. The authors conclude that welfare loss can equate to about USD 50 billion, which could lead to a cumulative welfare loss of 7% of annual consumption by 2050<sup>21</sup>.

The largest 3000 listed companies in Trucost's database, which represent a major part of the global equity market, are responsible for USD 2.15 trillion in environmental costs in 2008. This equates to 7% of their combined revenues and about a third of their profit. Institutional investors that invest USD 100 million in a typical large, diversified equity fund could 'own' USD 5.6 million in external costs caused by companies held in portfolios<sup>22</sup>.

### Providing clarity on ESG-related legal liability risks for investors and other financial institutions

In addition to market and operational risks, legal liability for both institutional investors and their agents is a growing issue. A UNEP FI report on the complex relationships between fiduciary law, ESG issues and institutional investment, often referred to as the 'Freshfields Report'<sup>23</sup>, covered nine major capital market jurisdictions and concluded that *'...integrating ESG considerations into an investment analysis so as to more reliably predict financial performance is clearly permissible and is arguably required in all jurisdictions.'* The 2009 follow-up report, 'Fiduciary II', concluded that in order to achieve the vision of the original Freshfields report, where trustees integrate ESG issues into their decision-making, ESG issues should be embedded in the legal contract between asset owners and asset managers, with the implementation of this framework being governed by trustees via client reporting. Equally, the report includes legal commentary that asset managers and investment consultants have a duty to proactively raise ESG issues with their clients, and that failure to do so presents *'a very real risk that they will be sued for negligence on the ground that they failed to discharge their professional duty of care to the client...'*<sup>24</sup>. The TEEB for Policy Makers report comes up with a similar message, as governments can hold companies liable for impacts on BES through the 'polluter pays principle'<sup>25</sup>.

Figure 3  
BP share price development between 20 April 2010 and 5 August 2010



BP's oil spill in the Gulf of Mexico in 2010 resulted in an estimated USD 90 billion loss in market capitalization<sup>14</sup> in share sell-off, clean-up and payouts. A major credit rating agency lowered the credit rating of BP in June 2010 from AA to BBB<sup>15</sup>. Insurers are charging 50% more for policies covering oil rigs in deep water and 25% more for those in shallow water, compared to premiums prior to the BP spill<sup>16</sup>. The stock price of BP fell from USD 60 per share on the 20th of April to a low of USD 27 on 25 June, climbing to USD 39 on 5 August, when the oil spill was contained. This corresponds to a drop of 35% in share price between the start and end of the spill (Figure 3).

Undoubtedly, this will refocus the debate around environmental and social risk considerations for both companies and those providing financial services to them. Since the end of the 1970s, the Gulf of Mexico has seen a tremendous increase in oil operations. As of 2010, more than 3800 oil platforms are active.

To understand whether practitioners in the financial sector believe that materiality of BES is growing, UNEP FI surveyed its members in August 2010. Signatories to the PRI were also invited to respond. The intention is to understand where financial institutions see exposure of BES risks emerging for a diversified financial sector. Table 1 provides an overview of the average score for each issue. These are based on 48 responses from financial institutions, and are visualized by the colour red ('material'), orange ('starting to become material') and white ('not material'). It is interesting to see that many financial institutions see BES emerging as a material issue, particularly in banking, insurance and certain parts of the investment sector. BES is foremost becoming material in the form of reputational challenges, followed by regulatory risk, operational risk, credit risk, and legal liability. Market, liability and systemic are generally not deemed of material importance, except for the insurance sector. Systemic risk related to BES is also deemed of importance for institutional investors such as pension funds.

Table 1  
**Exposure of BES risks for a diversified financial sector**  
based on 48 financial sector practitioners

	<b>Reputational risk</b> (association with adverse impacts on BES can result in severe damage to a company's brand)	<b>Credit risk</b> (natural-capital-associated risks that can cause the default of investments, inaccurate information on counterparties)	<b>Regulatory risk</b> (governments restricting access to and/or finance in biologically diverse areas)	<b>Operational risk</b> (acceleration of natural disasters, or ecological degradation on business losses and outputs, such as agriculture)	<b>Market risk</b> (market volatility influenced by BES loss)	<b>Liquidity risk</b> (BES loss affecting availability of liquidity)	<b>Legal liability/litigation risk</b> (Fis being held liable for BES degradation)	<b>Systemic risk</b> (BES loss affecting the functioning of [a segment of] the finance sector)
<b>Banking</b>								
Project finance	Material	Starting to become material	Starting to become material	Starting to become material	Not material	Not material	Starting to become material	Not material
Other structured finance	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Not material	Not material	Not material	Not material
Corporate finance	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Not material	Not material	Not material	Not material
<b>Investment</b>								
Private wealth management	Not material	Not material	Not material	Not material	Not material	Not material	Not material	Not material
Pension funds	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Not material	Not material	Starting to become material	Starting to become material
Insurance funds	Not material	Not material	Not material	Not material	Not material	Not material	Not material	Not material
Mutual funds	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Not material	Not material	Starting to become material	Not material
Sovereign wealth funds	Not material	Not material	Not material	Not material	Not material	Not material	Not material	Not material
Hedge funds	Not material	Not material	Not material	Not material	Not material	Not material	Not material	Not material
Private equity	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Not material	Not material	Not material	Not material
<b>Insurance</b>								
Insurance	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Starting to become material	Starting to become material
Reinsurance	Starting to become material	Not material	Starting to become material	Not material	Not material	Not material	Starting to become material	Not material

Not material
  Starting to become material
  Material

Respondents were asked to fill out the table with clients from the following sectors in mind: agriculture/food and beverage, forestry, fisheries, tourism, oil and gas, mining and metals, construction/building materials, utilities (thermal and hydro).

Respondents could assign scores to each cell: 0 = not material; 1 = starting to become material; 2 = material. Scores are based on the sum in each cell divided by the number of responses. Average scores < 0.67 are considered 'not material' (white). Average scores between 0.67 and 1.33 are considered 'starting to become material' (orange). Scores > 1.33 are considered 'material' (red).

# 3

## Evidence of biodiversity and ecosystem services materiality

This section aims to build the business case for BES by highlighting existing evidence. The emphasis is placed on only those issues seen as material in Table 1 above, particularly reputational, operational and legal liability risks. The questioning of BES' economic relevance centres on its perceived 'intangibility'. To break from this, this section reveals the ways in which BES is becoming systematically material for a significant part of the client base of banks, investors and insurers.



### 1. Reputational risk

A McKinsey survey of executives focused on the question of why biodiversity is important for businesses. It found that reputational challenges were mostly associated with biodiversity, followed by regulatory requirements (Figure 4a). Another study that focused specifically on the financial sector found similar results (Figure 4b)<sup>26</sup>.

### 2. Operational risks

As stated before, this is especially a concern for BES-dependent industries and those with major BES footprints. Here we focus on operational challenges in the following industries: oil and gas, mining, hydropower, fisheries, forestry and agribusiness.

**Oil and gas.** According to research by Goldman Sachs, the average value of the world's 230 top oil and gas projects is now USD 11.3 billion. Oil and gas companies must operate in ever-more-sensitive and challenging parts of the world to meet

energy needs. Non-technical risks, including ecosystem sensitivity, can account for up to 75% of cost and schedule failures on major oil and gas projects<sup>27</sup>. Sensitive regions include, but are not limited to, (deep sea) offshore oil drilling and drilling in tropical rainforests.

**Oil and gas**

The oil and gas sector has increasingly moved to deeper offshore oil drilling over the past ten years, with potentially severe repercussions on marine and coastal ecosystems. Financiers can require clients in this sector to use best-management practices to reduce failures to the highest possible extent, and refrain from financing oil and gas operations in marine ecosystems that are deemed too fragile, and for which environmental and biodiversity safety standards cannot be met.

Oil and gas businesses also increasingly operate in biologically diverse areas such as the Amazon. There are now ~180 oil and gas blocks covering ~688 000 km<sup>2</sup> of forest in the western Amazon, considered to be one of the most biologically diverse places on earth. Oil and gas development has caused major environmental and social impacts in the Amazon. Given the increasing scope and magnitude of planned hydrocarbon activity, these problems are likely to intensify without improved policies<sup>28</sup>. A growing number of financial institutions refrain from financing activities in World Heritage Sites, and 'high-conservation-value areas'. In addition, exploration within accepted international norms may be achieved by demanding from oil and gas clients the following<sup>29</sup>:

- Roadless extraction, which would greatly reduce environmental and social impacts;
- Proper attention to the rights of indigenous peoples and the outright protection of lands of peoples living in voluntary isolation, who may not be able to give informed consent.

■ **Mining.** Water exhibits a growing operational challenge for mining operations in regions that are either already distressed or will quickly become so. Operational risks manifest in two ways<sup>30</sup>. Water shortages can lead to power outages, especially in operations dependent on hydroelectric power to maintain operations. Second, given the high water demands of mining, companies may find that a lack of available water creates challenges in maintaining production.

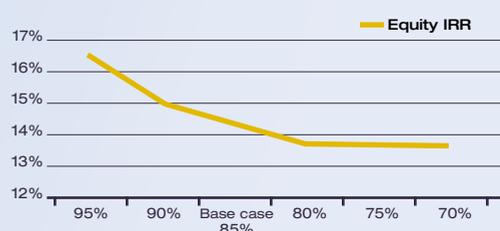
## Mining

Demand for water in arid and semi-arid regions in Chile could result in work stoppages or mine shutdowns if water resources become unavailable. Chile's copper industry is particularly affected by water scarcity concerns. A copper industry report released in 2009 projected that water consumption by the mining industry would increase by 45% by 2020<sup>31</sup>. Water demand in the country – of which mining is the largest industrial component – is six times greater than water renewals<sup>32</sup>. In Chile's arid north, mining threatens to deplete groundwater resources, which could ultimately result in the collapse of copper production – one of Chile's chief exports<sup>33</sup>.

■ **Hydropower.** Forest and mountain ecosystems provide water to two-thirds of the global population. Most businesses depend on reliable sources of water for their operations. Many businesses also influence water quality through their wastewater discharge. Given that most investments in power generation are long-term, and future water supplies are uncertain, lenders and investors are essentially increasingly placing bigger bets on adequate future water availability, and on the financial viability of their loans and investments<sup>34</sup>. A report from the World Resources Institute (WRI), for instance, showed that 79% of the new planned capacity of 60 GW will be built in areas that are already water scarce or stressed.

## Hydropower

HSBC and the WRI came to the conclusion that water shortages reduce power output in India. Each 5% drop in the plant load factor will result in nearly a 75-base-point drop in a project's internal rate of return (IRR)<sup>35</sup>. See Figure 5 (right)



■ **Fisheries.** Fishing of stocks has shifted increasingly to deeper water. Expected stocks have been depleted by 90% compared to pre-industrial fishing, resulting in lost economic benefits in the order of USD 50 billion annually. The real cumulative global loss of net benefits from inefficient global fisheries over the 1974 to 2007 period is estimated at USD 2.2 trillion<sup>36</sup>. According to TEEB for Business, the fishing sector is at risk of losing USD 80-100 billion in income and 27 million jobs<sup>39</sup>.

■ **Forestry.** The forestry sector is entirely dependent on natural resources, whether from natural or plantation stocks. In China, rapid deforestation has compromised ecosystem services such as watershed protection and soil conservation, leading to severe droughts or flooding in a number of major basins. Damages have been estimated at USD30 billion and thousands of lives. Elsewhere, the value of lost ecosystem services due to logging for the Chinese construction and materials sector was estimated at USD 12.2 billion annually<sup>37</sup>.

■ **Agribusiness.** Intensified farming, overuse of chemicals and water, and overgrazing have caused the degradation of soil and agricultural land and intensified desertification, which have resulted in the loss of productive land and output, not to mention increasing water scarcity and pollution<sup>38</sup>. The TEEB for Business report (2010) mentions that, overall, about 85% of agricultural land is considered to be degraded due to erosion, salinisation, soil compression, nutrient depletion, biological degradation or pollution, while each year 12 million hectares are lost to desertification<sup>39</sup>.

## Agribusiness

- Restricted supply of certain agricultural goods can cause price rises, which place pressure on food and beverage companies further down the supply chain. Additional costs from scarcity may need to be partly absorbed by companies, leading to reduced margins<sup>40</sup>. Food demand is also estimated to double by 2050, and with 70% of global freshwater withdrawals being directed to irrigation, the potential for major bottlenecks and risks for the agribusiness, food and beverage sectors remains high.
- The value of pollinators (native bees and other pollinating insects) to the global ecosystem is valued at approximately USD 190 billion a year<sup>41</sup>, through the provision of increased yields and other benefits. In the US, the 2007 collapse of bee colonies was calculated to have cost US producers USD 15 billion. In 2009, the Convention on Biological Diversity (CBD) estimated the economic impact of invasive species at USD 1.4 trillion globally; in other words, 5% GDP<sup>42</sup>.

### 3. Legislation and liability

The TEEB for Business (2010) report, and other recent publications, such as those by WEF and PwC (2010), provide a growing number of cases where companies are being held financially liable for BES impacts. For example, in 2003, indigenous Ecuadorians filed a suit against ChevronTexaco in an Ecuadorian court, charging the company with dumping toxic oil wastewater into 350 open pits as well as into Amazon basin wetlands and rivers that the tribes rely upon for drinking, bathing and fishing. The company is currently – in 2010 – involved in a USD27 billion court battle relating to alleged toxic contamination of local rainforests and rivers<sup>43</sup>. Financial institutions are exposed if such litigation cases affect an investee's share price. In the case of the EU Environmental Liability Directive (ELD), financial institutions should assess if and how this enhances the exposure of clients to BES liability.

The ELD makes companies directly liable, not only for personal liability, but also for impacts on water resources, fauna, flora and natural habitats. Operators of risky or potentially risky activities can be held liable for the costs of preventing or remedying environmental damage (EU 2004)<sup>44</sup>. Under the terms of the Directive, environmental damage is defined as:

- Direct or indirect damage to the aquatic environment covered by Community water management legislation;
- Direct or indirect damage to species and natural habitats protected at Community level by the 1979 'Birds Directive' or by the 1992 'Habitats Directive';
- Direct or indirect contamination of the land that creates a significant risk to human health.

The new ELD is broadening the liability sphere of operations with potential adverse impacts on water bodies and biodiversity. Certain member states have chosen to implement more stringent measures; for example, by restricting the application of the 'permit' and 'state of the art' defences, expanding the range of protected species and natural habitats, or holding all operators strictly liable for biodiversity damage. Insurance firms are not obliged in most EU countries to offer coverage for this new form of 'biodiversity' liability, except for in Hungary, Slovenia and Sweden, where coverage by insurance companies is compulsory<sup>45</sup>.



**“ As humankind we consider ourselves to be the predominant species on the planet. From the lens of nature, we are one of many and the most adversarial.**

At YES BANK, we respect the ecosystem and our role in it. YES BANK's Responsible Banking approach is sensitive to environmental and social impacts as part of sustainable financing. We actively support UNEP FI in its vision for a greener world and we were the first Indian bank to become a signatory. ”

**Rana Kapoor**

Founder/Managing Director & CEO, YES BANK

**“ Of all species that have existed on earth 99 percent are now extinct. Let us try to do more than our best to practice and promote sustainability in all sectors in the combat against the extinction of species in order to save the remaining one percent. ”**

**Orhan Beskok**

Executive Vice President, TSKB

# 4

## Making biodiversity and ecosystem services operational for finance

**B**iodiversity and ecosystem services (BES) is starting to be recognized by the financial sector as a material issue, although many companies are early on in their thinking on the issue<sup>46</sup>. The diagram below illustrates how BES can be factored into financial institutions, lending, investment and insurance.

A survey by UNEP FI asked its members how BES is currently incorporated into financial products and services, and on an organisational level. Respondents comprised representatives of 48 banks, asset managers, asset owners and insurers. Figure 6a showcases how BES is accounted for on an organisational level, whereas Figure 6b details how banks, investors and insurers deal with it in their products, services and strategies.

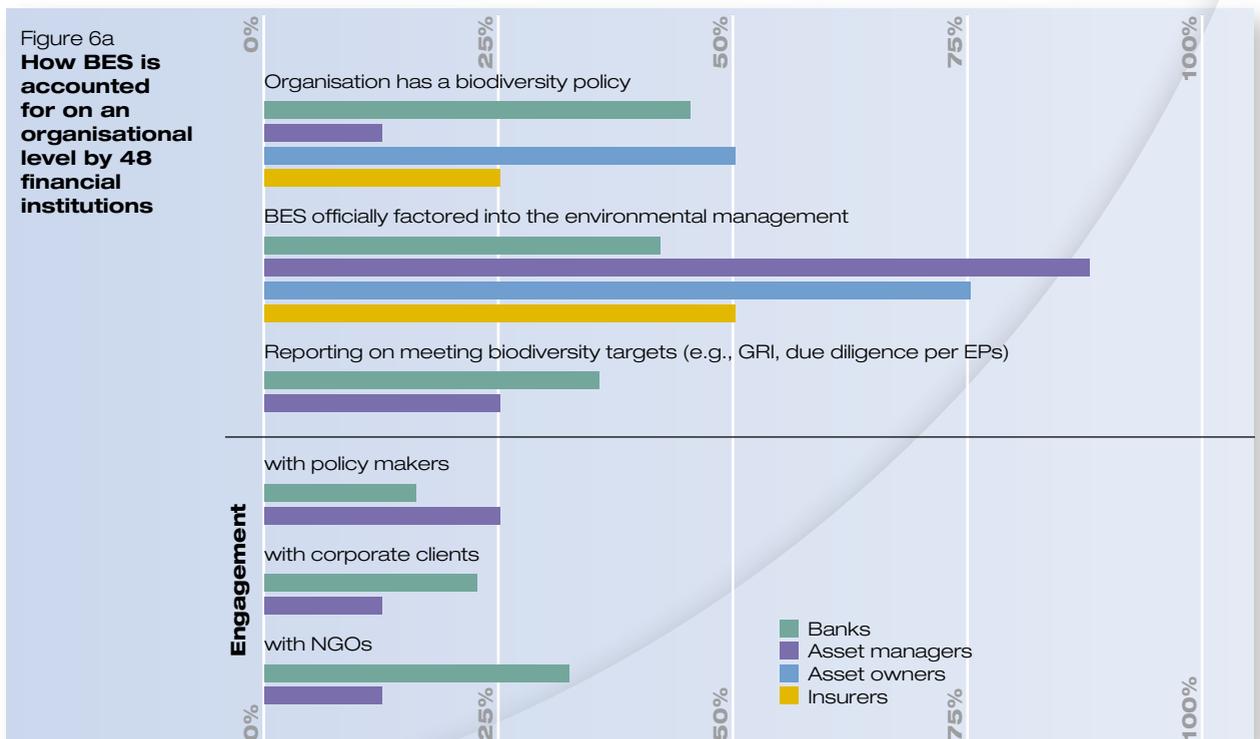
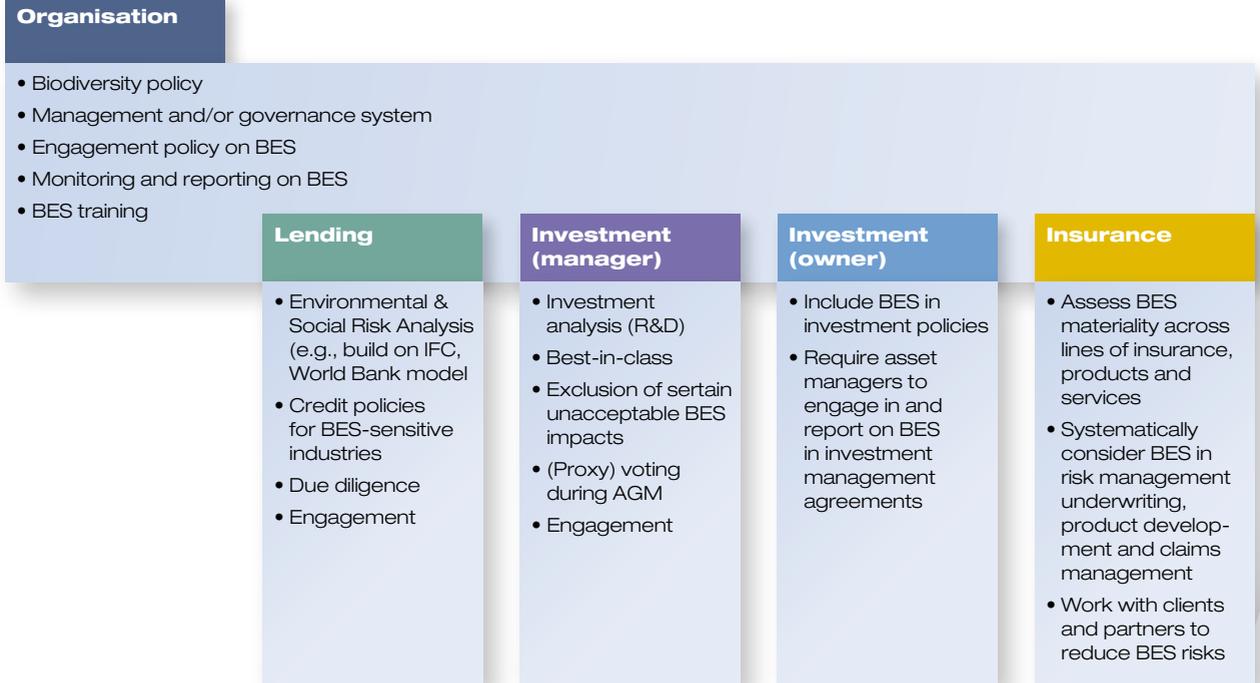
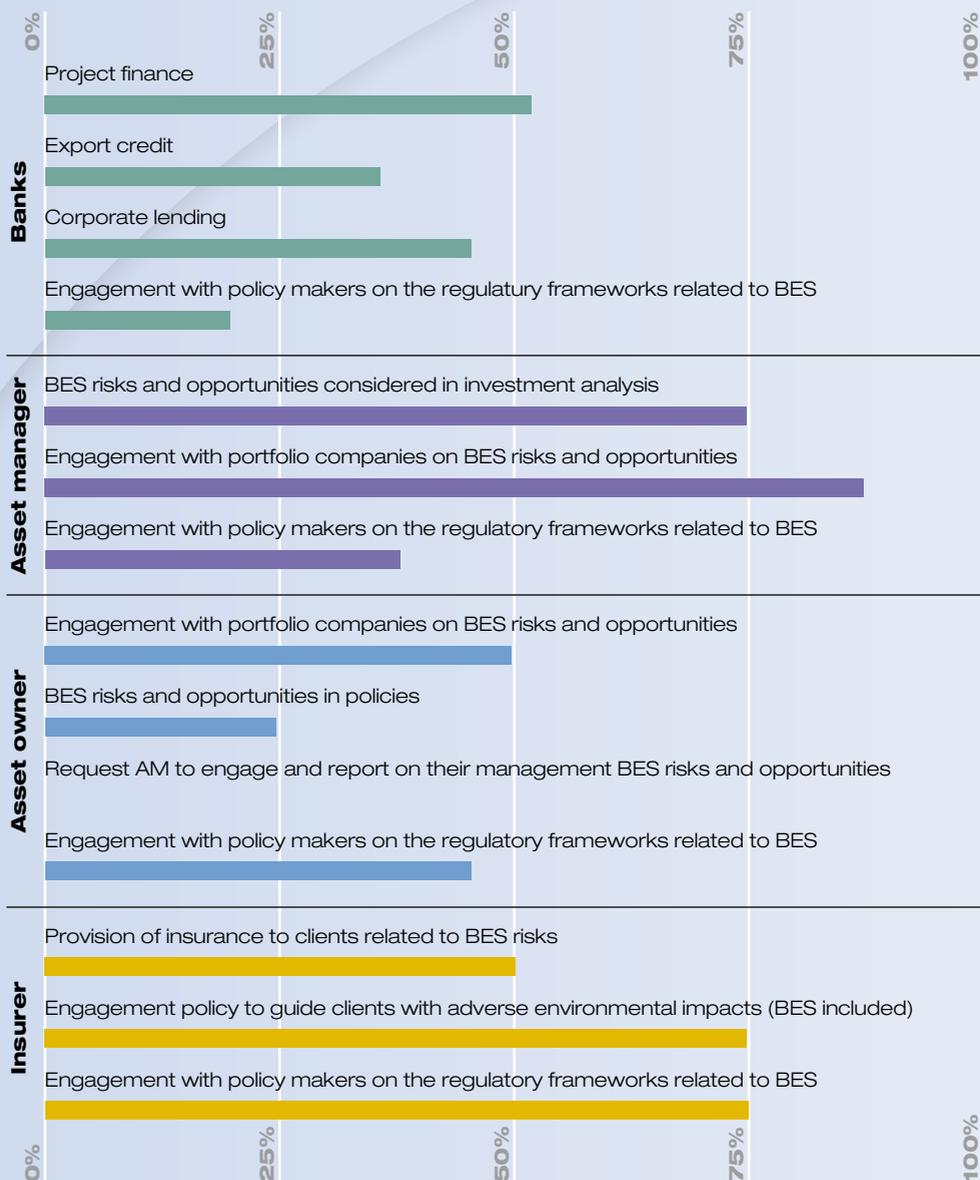


Figure 6b  
**How BES is accounted for in the products and services of 48 financial institutions**



Results reveal that BES is starting to be hardwired on an organisational level by UNEP FI members and PRI signatories, especially by banks and asset managers. Most members, however, have not yet taken action to embed BES in their organisation. A different picture emerges when we look at how BES is factored into financial products, services and strategies. A significant number of banks, asset managers and owners, and insurers claim to embed BES in financial products and services. The following section shows how a number of forward-looking financial institutions actually embed BES in their operations.

### **How Banks Account for BES**

Project finance is the most obvious segment within lending where BES has become material. Historically, the main driver for the consideration of this issue has been reputational risk associated with project finance. BES can also have direct financial effects if it leads to project delays due to a lack of social license to operate. The Equator Principles are encouraging emerging sophistication of consideration of environmental and social risk in project finance. BES also has relevance in export credit and other forms of structured finance. Much less clear is how BES affects corporate lending – day-to-day lending to large corporate clients. For certain high-biodiversity-impact and -dependency sectors, and in regions where ecosystem services are already moderately or severely degraded, operational risks to debtors may arise. The boxes provide insight into how Rabobank and Credit Suisse deal with BES.

## How Rabobank has integrated biodiversity into its core business

Rabobank is a global food and agribusiness bank. It has defined five Food & Agribusiness Principles, one Principle being 'responsible natural resource management'. This Principle is broken down into a number of measures, such as preventing land degradation and soil erosion, minimising pollution of ground and surface water, preventing overfishing, minimising harm to sea life environment, and preserving high-conservation-value areas and biodiversity in general.

Derived from these Principles, Rabobank has defined so-called supply-chain policies for a number of sectors in which the bank is very active, specifically in food and agribusiness. In each of those policies, biodiversity and ecosystem services play a central role, as they are treated as a risk or opportunity for credit decisions, acquisitions and engagement with customers. The policies focus on clients in the following sectors: 1) fisheries; 2) palm oil; 3) soy; 4) sugarcane; 5) cocoa; 6) coffee; 7) biofuels; 8) cotton; 9) forestry; 10) aquaculture; 11) oil and gas; 12) mining. Other crosscutting policies are concerned with animal welfare and genetically modified organisms. The bank is currently in the final stages of a specific policy on biodiversity.

## How Credit Suisse factors in biodiversity and ecosystem services considerations

Credit Suisse addresses biodiversity in business through its high-level sustainability policy, strategy and process. Its sustainability risk management process is implemented independently but may also be fed into a broader reputational risk process. Through the sustainability risk process, the bank identifies and addresses any significant environmental and/or social (labour, community) impacts. However, ecosystem impacts and/or biodiversity loss are more often than not of key concern in any given transaction, and particularly in relation to land use conversion. Credit Suisse's process applies to all types of businesses that involve sensitive industries (e.g., extractives, forestry, agribusiness), not just loans. It has a core focus on identifying and avoiding the conversion of high-conservation-value forest, and in this regard has industry-specific sustainability policies and guidelines. The bank also encourages its clients, in any given sensitive industry, to transition towards best management practices, and requires membership in relevant industry bodies such as the Forest Stewardship Council (FSC) and the Roundtable on Sustainable Palm Oil (RSPO).

## How Investors Account for BES

In a large part of the investment business, BES is not considered a material risk or opportunity. The findings and recommendations of the TEEB report suggest that this situation will change, and those investors that are aware of this and act to put processes in place to understand and safeguard their investments against impact and dependence on BES are positioning themselves to realise competitive advantage. Two cases are put forward that highlight how an asset owner and an asset manager deal with BES.

## VicSuper: Mainstreaming BES in asset ownership

VicSuper is a large Australian pension fund that explicitly integrates sustainability considerations throughout its operations and investments to deliver better long-term outcomes to its beneficiaries. As of 30 June 2010, VicSuper had approximately AU\$ 7.2 billion in assets under management. BES is one of the key sustainability considerations the Fund is seeking to integrate into all of its investments over time.

VicSuper addresses BES in a number of ways in its investment activities through:

- The selection and management of investments. VicSuper explicitly considers BES risks and opportunities in a number of listed and private equities selected for their superior sustainability performance, and an innovative investment in land and water that seeks to achieve investment returns from sustainable agriculture and from payments for ecosystem services.
- Collaborative engagement initiatives. VicSuper is a signatory to a number of initiatives including the Forest Footprint Disclosure, Carbon Disclosure Project (CDP), CDP Water Project, and the Investor Group on Climate Change Australia/New Zealand.
- Company engagement. VicSuper uses third parties to engage with the companies in which it invests on material sustainability issues including climate change, biodiversity, forestry and water. This applies only to listed equities, comprising about half of the Fund's total assets under management.

## **Robeco's approach as an asset manager to account for BES in the pharmaceutical sector**

As part of a new focus on biodiversity and ecosystem services, Robeco undertakes engagement with companies that are dependent upon BES for their operations, such as the agribusiness, tourism and pharmaceuticals sectors, among others.<sup>47</sup> The dependency of agribusiness on BES is well documented, while for other sectors such as pharmaceuticals there is a lack of understanding concerning the extent to which the sector depends on BES and integrates risk management policies and practices into its operations.

Robeco aims to use engagement to raise awareness and drive responsible behaviour in the pharmaceutical sector regarding this dependency. The rationale is to assess the opportunity for driving company performance through innovative use of BES, and to highlight the link between risk management and biodiversity dependency for the investor community. The results of engagement can be communicated to portfolio managers to assist them in their portfolio construction or in their understanding of a company's risk exposure to certain BES issues, thereby potentially impacting their investment decision-making.

## **How Insurers Account for BES**

For insurance companies, BES risks can adversely impact both their underwriting profitability (e.g., floods due to deforestation leading to insured or uninsured losses) and investment returns. Insurance companies are not only risk carriers that provide insurance products – they are also risk managers through their loss prevention and loss mitigation services. Opportunities arise for forward-looking insurers to develop new products that can differentiate themselves from competitors. HSBC Insurance in Brazil and Tokio Marine & Nichido Fire Insurance in Japan have developed new insurance products. They compensate for the carbon emissions of clients by conserving native forests (in the case of Brazil) and planting mangroves (in the case of Japan).

### **HSBC Insurance Brazil's Green Insurance: A way to differentiate from competitors**

Launched in 2007, HSBC Green Insurance is a regular motor and auto insurance product that, in addition to all of the regular benefits of insurance products, enables its clients to mitigate their carbon emissions from their homes or vehicles. Created in partnership with the NGO Sociedade de Pesquisa em Vida Selvagem (SPVS) – Green Insurance compensates for the carbon emissions by conserving an area of native forest proportional to the estimated average carbon emissions of a vehicle or a home. From 2007 to June 2010, Green Insurance contributed to the preservation of more than 27 million m<sup>2</sup> of native forest, including seriously threatened remnants of araucaria forest. The product is considered best practice by the group and has been replicated in other countries in Latin America. It allows HSBC Insurance Brazil to differentiate itself from competitors.

With their long maturation, forests are a suitable asset to match with commitments by pension funds to long-term income streams. Products like weather derivatives and catastrophe bonds can provide investors with risk transfer solutions.<sup>47</sup> The insurance industry, understandably, is quite cautious in developing new products, particularly for 'emerging risks', including environmental risks such as BES. Nevertheless, there are good indicators of opportunities. For example, data from a 2009 global survey by the UNEP FI Insurance Working Group on understanding and integrating ESG factors in insurance underwriting and product development suggest that biodiversity loss and ecosystem degradation and water management combined present opportunities across agroforestry, casualty, health, life, marine aviation and transport, and property<sup>48</sup>.

# 5

## Bearish or bullish? Tapping into growing environmental markets

**F**inancial institutions can seize opportunities related to BES in different ways:

- Early movers that can demonstrate integration of BES can bolster their organisation’s reputation and create value for marketing practices.
- Building capacity in-house on BES can be beneficial in terms of advisory services for corporate clients.
- Advising clients how to integrate BES in supply chain management can lead to cost reductions for clients.
- Environmental markets are increasingly starting to take shape in a growing number of countries (Table 2). Financial institutions that understand these markets may profit through offering brokerage services, registries, or specialised funds.

A number of countries have pledged a combined amount of USD 5.8 billion<sup>49</sup> to get markets started for carbon credits related to avoiding deforestation (REDD+). Estimating the future size of a REDD+ market is challenging, as it depends on factors such as future emission trends in countries, stringency of targets in a new post-2012 climate change agreement and the performance of ‘competing’ mechanisms. Rough estimates can be made on the supply side. A study by EcoSecurities in 2007<sup>50</sup> calculated annual market sizes for REDD+ credits between USD 3 and 30 billion, for reduction targets in deforestation of between 5% and 50% compared to a 1990–2005 baseline.

Table 2  
**Environmental markets that factor in BES directly or indirectly**

BES asset class	Market value	Year	Market type
Biodiversity mitigation / offsets	USD 1.8 – 2.9 billion	2008	Private (cap and trade) <sup>51</sup>
Biocarbon			
Voluntary OTC (forestry carbon), incl. REDD+	USD 31.5 million	2008	Private (voluntary) <sup>52</sup>
Chicago Climate Exchange – forest carbon	USD 5.3 million	2008	Private (voluntary)
CDM – reforestation / afforestation	USD 0.3 million	2008	Private (cap and trade)
Cosmetics/ personal care / pharmaceuticals: bio-prospecting contracts	USD 30 million	2008	Private (voluntary) <sup>39</sup>
Certified agricultural products, incl. non-timber forest products (NTFPs)	USD 40 billion	2008	Private (voluntary) <sup>39</sup>
Certified forest products (FSC, PEFC)	USD 5 billion (FSC certified products)	2008	
Payments for Watershed Services (private voluntary)	USD 5 million (e.g. Costa Rica, Ecuador)		
Payments water-related ecosystem services (government)	USD 5.2 billion	2008	Public <sup>39</sup>
Other payments for ecosystem services (government-supported)	USD 3 billion	2008	Public <sup>39</sup>
Private land trusts, conservation easements (e.g. North America, Australia)	USD 8 billion (in the U.S. alone)	2008	Public <sup>39</sup>

Recent years have also witnessed a number of attempts to set up investment funds that invest in businesses and projects that render both ecological and financial returns, although fund sizes are notably limited. Early attempts have been predominantly started by NGOs such as Conservation International through Verde Ventures, and The Nature Conservancy through the EcoEnterprise Fund. The latter invested USD 6.3 million of debt capital in 23 small and medium enterprises. More recently, a number of companies have entered the scene with innovative investment approaches that seek to make larger investments. Three cases are shown here: Sumitomo Trust’s new Biodiversity Investment Fund; Agro-Ecological’s innovative investment approach to organic agriculture; and New Forests’ investments in environmental markets. Such funds may provide interesting alternatives for investment managers and owners seeking an avenue to underdeveloped and novel markets.

## **Sumitomo Trust and Banking Co launched a new and unique Biodiversity Investment Fund**

In August 2010, Sumitomo Trust launched an actively managed Japanese equity fund, which factors in biodiversity. It is the first equity mutual fund of its kind globally. The fund invests in Japanese companies that are actively engaged in biodiversity conservation using Sumitomo's investment research. In selecting stocks and building portfolios, the bank focuses on the following three points in stock picking:

- Whether a company is actively working on reducing the effect of its business activities on biodiversity (risk management);
- Whether a company offers skills and services that contribute to the protection of biodiversity (opportunity); and
- Whether a company establishes long-term goals such as action plans to preserve biodiversity.

Companies that are being screened and considered include those with technologies that can reduce the negative impact on biodiversity, companies with technologies that can secure biodiversity, and companies with medium- or long-term plans to secure biodiversity. The bank believes that the mutual fund would provide financial support for biodiversity-oriented corporate activities, encouraging individuals who are interested in biodiversity issues to contribute to the fund.

## **Agro-Ecological Investment Management - A novel investment approach to an old sector**

Agro-Ecological is a specialist asset management boutique focused on investment in agriculture/farmland as an asset class managed organically. Its investment strategy is based on acquiring conventional farms and transforming them into organically managed assets, for improved resilience, cash flow and long-term capital appreciation. The Agro-Ecological approach claims it creates measurably superior biodiversity and ecosystem services (BES). The superior biodiversity outcomes are not merely a positive externality but a deliberate strategy to generate enhanced productive performance and, as a result, superior financial performance; i.e., better BES outcomes generate better financial outcomes. This superior investment performance is achieved without the benefit of biodiversity markets generating a direct income.

Its geographical scope extends beyond the initial focus on New Zealand, with projects being developed for Africa, Latin America and the United States. Investment in pastoral-based farming in New Zealand targets returns in the region of 10-13% (appreciation and cash yield), while the incorporation of a perennial crop component within a portfolio can push returns into the mid-teens. Investment returns are generated through the sale of organic agricultural commodities (annual cash yield) – e.g., milk – and ultimately through exiting the entire portfolio by way of sale to institutions or strategists or as an initial public offering (IPO).

## **New Forests is finding a niche in growing markets for ecosystem services and products**

New Forests is a timberland investment management company with expertise in monetizing eco products, such as carbon and biodiversity, as added value in timberland investments or as stand-alone assets. The company manages the Australia New Zealand Forest Fund, investing in sustainable plantation forestry assets in Australia and New Zealand, and the Eco Products Fund, investing in conservation and mitigation banking instruments and pre-compliance carbon primarily in the United States. Clients include long-term institutional and private equity investors seeking exposure to the relatively stable returns from timber in mature markets and the higher risk-adjusted returns available from new geographic markets, such as Asia, and new asset classes, such as eco products.

New Forests manages the Malua Biodiversity Bank in Sabah, Malaysia, as a commercial investment in the conservation of 34,000 hectares of pristine orang-utan habitat adjacent to recently converted palm oil plantations. The company also manages forest carbon investments exposed to the California carbon market and emerging international markets with extensive expertise related to Reducing Emissions from Deforestation and Degradation (REDD). The company is headquartered in Australia, with multiple branches across the globe.

## A Vision for 2020

**W**e cannot look into a crystal ball to picture what 2020 will look like. However, it is plausible that biological diversity and the ecosystem services that underpin it will further decline. Successful and responsible finance means being able to understand how macro and micro external factors like climate change, ecosystem degradation and water scarcity affect consumer behaviour, demand for products, and the competitiveness of sectors and companies in different geographies. Governments may increasingly step up to protect ecosystems in order to make significant contributions to halt biodiversity loss by 2020. This will further amplify the legal liability of firms with severe negative impacts on ecosystems. Lenders, investors and insurers need to properly value this new form of liability in the creditworthiness of a client. With the Rio+20 Earth Summit in 2012 approaching, this section seeks to provide a vision for 2020 of the implications for banks, investors and insurers. It also provides recommendations for how to further hardwire BES into financial products and services.

### For banks

- The legal liability of corporate clients in sectors with severe negative impacts on BES is further amplified. As a result, BES is integrated into routine risk analyses and management systems.
- Consumers will increasingly understand the links between finance, corporate activities on the ground and ecosystem degradation, and demand from their banks that certain types of finance with unacceptable social and environmental impacts be banned.
- Mismanagement of impacts and dependence on BES will become increasingly significant reputational risks by association for banks, especially in relation to structured finance.
- Opportunities for new products and services are arising that positively influence BES, and can offer a return.

### For investors

- Investors realise that a growing number of companies in the highly-BES dependent sectors, such as fisheries, tourism, forestry and agriculture, will become less competitive due to an adverse ecological state of the commodities they depend on. At the same time, companies in an increasing number of extractive, industrial and commercial sectors behave more progressively as they understand that long-term shareholder value is enhanced by both embedding ESG considerations into their long-term strategy and by fully disclosing their progress to investors. Investors stimulate this process by increasingly becoming active owners through engagement and voting.
- BES is recognized as a financially material factor that influences the economics and stock value evaluation of sectors, similar to what we see today with climate change or carbon footprints.
- Mainstream investors expect that investee companies have implemented a strategic approach to addressing their impacts and dependencies on biodiversity and ecosystem services, and that they will disclose this approach in their annual reporting.
- Investors will actively search for investments that provide solutions to BES challenges in much the same way that investors are funding investments providing solutions to climate change challenges today. Institutional investors will routinely include consideration of BES risks/opportunities when searching for new fund managers.

### For insurers

- Governments are stepping up to protect ecosystems in order to make significant contributions to halt biodiversity loss by 2020. This will further amplify the legal liability of firms with severe negative impacts on ecosystems.
- The development of prudential legal frameworks on BES risks will underpin the insurability of BES risks, the development of relevant insurance products, and the management of insurance claims.

## Recommendations to further hardwire BES into finance

- 1.** Develop a set of principles that detail how BES should be embedded in finance, and seek official support from financial institutions for such an initiative. Such principles should focus on developing and promoting the use of clear, simple and practical guidance and checklists on BES for finance. These could be developed akin the Principles for Responsible Investment (PRI) or the Principles for Sustainable Insurance (PSI) that are currently developed by UNEP FI.
- 2.** The TEEB for Business report summary<sup>39</sup> states seven key action points for business. Financial institutions can assess and evaluate how clients deal with BES using these action points.
- 3.** There is a lack of understanding of how ecological considerations are used in practise when assessing the long-term risk of investments. To adjust risk models for BES risks, financial institutions such as credit rating agencies should establish criteria for evaluating country-based BES risks. Such criteria can then be incorporated into country risk rating systems.
- 4.** Financial institutions should start to cooperate with initiatives such as the Natural Value Initiative, Forest Footprint Disclosure and the Global Reporting Initiative to build capacity in-house on BES, hedge BES risks that are emerging, and engage with clients in relevant sectors on BES.
- 5.** UNEP FI should take the lead to develop a training module on BES to build capacity with its members to assess its materiality, and integrate evaluation and management of BES into relevant financial products, services and strategies.



**“ This study is an essential step forward in recognising the value of all living organisms and ecosystems for our own well being. This being the year of biodiversity, the business community should publicly embrace its responsibility to protect and restore ecosystem services.**

ASN Bank, for one, has published its Issue paper on Biodiversity, formulating its investment policy on biodiversity. The UNEP FI CEO Briefings continue to provide guidance to ASN Bank in formulating and implementing this policy. ASN Bank hopes it will do the same for other financial institutions. ”

**Ewoud Goudswaard**  
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# Notes and references

1. Unilever takes stance against deforestation. [www.unilever.com/sustainability/news/news/december2009unilevertakesstanceagainstdeforestation.aspx](http://www.unilever.com/sustainability/news/news/december2009unilevertakesstanceagainstdeforestation.aspx)
- Nestle: [SpeechesAndStatements/AllSpeechesAndStatements/statement\\_Palm\\_oil.htm?wordId=D7E0005D-F7D9-4AD3-85D7-AA631CBA0E8E](http://www.nestle.com/press/StatementsAndStatements/statement_Palm_oil.htm?wordId=D7E0005D-F7D9-4AD3-85D7-AA631CBA0E8E)
- Burger King to stop buying oil from Sinar Mas. <http://baliholidayinfo.com/content/burger-king-stop-buying-oil-sinar-mas>. Krafting a new story on oil palm: <http://understory.ran.org/2010/08/19/krafting-a-new-story-on-palm-oil/>
2. New York Times, 2010. Banks Grow Wary of Environmental Risks. 30 August 2010. [www.nytimes.com/2010/08/31/business/energy-environment/31coal.html?\\_r=3](http://www.nytimes.com/2010/08/31/business/energy-environment/31coal.html?_r=3)
3. UNEP FI, 2008. Bloom or Bust? UNEP Finance Initiative: Geneva
- UNEP FI, 2007. CEO Briefing – Bloom or Bust? UNEP Finance Initiative: Geneva
4. McKinsey, 2009. Global capital markets: Entering a new era. McKinsey Global Institute
5. UNEP FI, forthcoming. Lenses and clocks – Financial stability and systemic risk. UNEP Finance Initiative: Geneva.
6. The Economist, 2010. The Gods Strike Back. A special report about financial risk. February, 2010.
7. Mulder, I., 2007. Biodiversity, the Next Challenge for Financial Institutions? World Conservation Union (IUCN): Gland
8. WEF, 2010. Global Risks 2010 report. World Economic Forum: Geneva
9. PwC, 2010. PricewaterhouseCoopers 13th Annual Global CEO Survey 2010. London
10. McKinsey, 2010. The next environmental issue for business: McKinsey Global Survey results. McKinsey Quarterly.
11. Equator Principles, 2006. A financial industry benchmark for determining, assessing and managing social and environmental risk in project financing. [www.equator-principles.com](http://www.equator-principles.com)
- Esty, B. C., Knoop, C., and Sesia, A., 2005. The Equator Principles: An industry approach to managing environmental and social risks. Harvard Business School, Boston
12. Facilitated by the IFC, a small group of financial institutions is looking into whether and how the Equator Principles can be expanded beyond project finance.
13. Austin, D., and A. Sauer, 2002. Changing Oil: Emerging environmental risks and shareholder value in the oil and gas industry. World Resources Institute: Washington, D.C.
14. "Low carbon growth in Asia", comments on BP at the 16-June, 2010, UNEP FI event in Seoul, Republic of Korea, by Michael Dieschbourg, CEO, Legg Mason Global Currents
15. Bloomberg, 2010. BP's Credit Rating Cut by Fitch to Two Levels Above Junk. [www.bloomberg.com/news/2010-06-15/bp-s-credit-rating-cut-by-fitch-to-bbb-two-levels-above-junk-from-aa.html](http://www.bloomberg.com/news/2010-06-15/bp-s-credit-rating-cut-by-fitch-to-bbb-two-levels-above-junk-from-aa.html) (consulted August 2010)
16. Bloomberg, 2010. Insurers Raise Deep-Water Oil Rig Prices 50% After BP Spill, Moody's Says. [www.bloomberg.com/news/2010-06-03/insurers-raise-deep-water-oil-rig-prices-50-after-bp-spill-moody-s-says.html](http://www.bloomberg.com/news/2010-06-03/insurers-raise-deep-water-oil-rig-prices-50-after-bp-spill-moody-s-says.html) (consulted August 2010)
17. Seitchik, A., 2007. CFA, Climate Change from the Investor's Perspective.
18. PRI and UNEP FI, forthcoming. Universal Ownership: Why externalities matter to institutional investors.
19. The actual value of externalities is likely to be higher, since the analysis excludes most natural resources used, as well as environmental impacts such as water pollution, due to lack of global data. The COPI (Cost of Policy Inaction) used a different approach. Due to lack of global data, the TEEB analysis excludes the majority of natural resources used, as well as environmental impacts including water pollution, land use change, soil degradation, pesticide and fertiliser residues and emissions of ozone-depleting substances. Taken from "PRI and UNEP FI, forthcoming in 2010. Taking the environment into account. Universal Ownership: Why externalities matter to institutional investors"
20. Braat, L., and P. ten Brink, 2008. Cost of Policy Inaction (COP): The Case of not Meeting the 2010 Biodiversity Target. European Commission: Brussels
21. TEEB, 2008. The Economics of Ecosystems and Biodiversity - An interim report. European Commission, Brussels
22. This is based on Trucost's analysis of externalities from 2,439 companies listed in the Index MSCI All Country World Index, used as a proxy for a hypothetical equity portfolio that reflects Index sector weightings. Taken from "PRI and UNEP FI, forthcoming. Universal Ownership: Why externalities matter to institutional investors"
23. Freshfields Bruckhaus Deringer and UNEP FI, 2005. A legal framework for the integration of environmental, social and governance issues into institutional investment. UNEP FI: Geneva
24. UNEP FI, 2009. Fiduciary responsibility – Legal and practical aspects of integrating environmental, social and governance issues into institutional investment. UNEP FI: Geneva
25. TEEB, 2009. The Economics of Ecosystems and Biodiversity for National and International Policy Makers – Summary: Responding to the Value of Nature 2009. European Commission: Brussels
26. Mulder, I. and T. Koellner, in press. Hardwiring Green – How Banks Account for Biodiversity Risks and Opportunities. Journal of Sustainable Finance and Investment
27. Snashall, D., 2010. Keeping oil and gas mega projects moving – grappling with Non Technical Risk. Environmental Risk Management – ERM.[www.erm.com/Analysis-and-Insight/Articles/Keeping-oil-and-gas-mega-projects-moving--grappling-with-Non-Technical-Risk/](http://www.erm.com/Analysis-and-Insight/Articles/Keeping-oil-and-gas-mega-projects-moving--grappling-with-Non-Technical-Risk/) (consulted August 2010)
28. Finer M, Jenkins C.N, Pimm S.L, Keane B, and C. Ross, 2008. Oil and Gas Projects in the Western Amazon: Threats to Wilderness, Biodiversity, and Indigenous Peoples. PLoS ONE 3(8): e2932. doi:10.1371/journal.pone.0002932
29. Finer M, Jenkins C.N, Pimm S.L, Keane, and B. Ross C, 2008. Oil and Gas Projects in the Western Amazon: Threats to Wilderness, Biodiversity, and Indigenous Peoples. PLoS ONE 3(8): e2932. doi:10.1371/journal.pone.0002932
30. Miranda, M., and A. Sauer, 2010. Watered Down? Water Risks and Disclosure in the Mining Sector. World Resources Institute: Washington D.C.
31. Cochillo, 2009. "Consumption of water in the Chilean mining industry: actual situation and projections." Presented November, 18 2009.
32. [www.geim.org/archivos/session\\_d/Natural%20Water%20Resources.ppt#312,34,Slide 34](http://www.geim.org/archivos/session_d/Natural%20Water%20Resources.ppt#312,34,Slide%2034)
33. Global Water Intelligence. 2009. A new dawn for desalination in Chile. Global Water Intelligence. Vol. 10(12). Available at: [www.globalwaterintel.com/archive/10/12/general/a-new-dawn-for-desalination-in-chile.html](http://www.globalwaterintel.com/archive/10/12/general/a-new-dawn-for-desalination-in-chile.html).
34. UNEP FI, 2010. Chief Liquidity Series issue 2 – Power Sector. UNEP FI: Geneva
35. Sauer, A., Klop, K., and M. Agrawal, 2010. Over heating - Financial Risks from Water Constraints on Power Generation in Asia. World Resources Institute: Washington D.C.
36. World Bank and FAO, 2008. The Sunken Billions: Economic Justification for Fisheries Reform. World Bank: Washington D.C.; Food and Agriculture Organization: Rome
37. McVittie, 2010 in TEEB, 2010. Business impacts and dependence on biodiversity and ecosystem services, in The Economics of Ecosystems and Biodiversity: TEEB for Business
38. WEF, PwC, 2010. Biodiversity and Business Risk: A Global Risks Network Briefing. World Economic Forum: Geneva
39. TEEB, 2010. The Economics of Ecosystems and Biodiversity Report for Business - Executive Summary. European Commission: Brussels
40. F&C Management, 2004. Is biodiversity a material risk for companies? An assessment of the exposure of FTSE sectors to biodiversity risk. F&C Investments: London
41. Operation pollinator. [www.operationpollinator.com/need.asp](http://www.operationpollinator.com/need.asp)
42. CBD Business and Biodiversity newsletter. [www.cbd.int/doc/newsletters/news-biz-2009-06-en.pdf](http://www.cbd.int/doc/newsletters/news-biz-2009-06-en.pdf) <http://www.cbd.int/doc/newsletters/news-biz-2009-06-en.pdf>
43. The Sunday Times Magazine, The Amazon's Dirty War, November 2009.
44. [http://europa.eu/legislation\\_summaries/enterprise/interaction\\_with\\_other\\_policies/l28120\\_en.htm](http://europa.eu/legislation_summaries/enterprise/interaction_with_other_policies/l28120_en.htm)
45. MMC, 2009. New environmental liabilities for EU companies. Marsh Ltd: London
46. Mulder, I. and T. Koellner, submitted. Hardwiring Green – How Banks Account for Biodiversity Risks and Opportunities. Journal of Sustainable Finance and Investment.
47. UNEP FI, 2007. Insuring for sustainability - Why and how the leaders are doing it. UNEP FI, Geneva.
48. UNEP FI, 2009. The global state of sustainable insurance – Understanding and integrating environmental, social and governance factors in insurance. UNEP FI Insurance Working Group: Geneva
49. UNEP, 2010. Bringing forest carbon projects to the market. United Nations Environment Programme: Nairobi
50. EcoSecurities, 2007. REDD Policy Scenarios and Carbon Markets - A policy brief. Oxford.
51. Madsen, B., Carroll, N., Moore Brands, K., 2010. State of Biodiversity Markets Report: Offset and Compensation Programs Worldwide. Ecosystem Marketplace: Washington D.C.
52. Hamilton, K., Chokkalingam, U., and M. Bendana, 2009. State of Forest Carbon Markets – Taking Root and Branching Out. Ecosystem Marketplace: Washington D.C.

## About UNEP Finance Initiative (UNEP FI)

The United Nations Environment Programme Finance Initiative (UNEP FI) is a global partnership between the United Nations Environment Programme and the private financial sector. UNEP FI works closely with nearly 200 financial institutions that are Signatories to the UNEP FI Statements, and a range of partner organisations, to develop and promote linkages between the environment, sustainability and financial performance. Through regional activities, a comprehensive work programme, training activities and research, UNEP FI carries out its mission to identify, promote, and realise the adoption of best environmental and sustainability practice at all levels of financial institution operations.

## About the Biodiversity & Ecosystem Services Work Stream (BESWS)

The Biodiversity & Ecosystem Services Work Stream (BESWS) is based on the need to engage the financial services sector in identifying and addressing the challenges arising from the loss of biodiversity and the degradation of ecosystem services.

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